DOCUMENT RESUME

ED 273 261 IR 012 265

AUTHOR Kaye, Tony
TITLE Computer-Mediated Communication Systems for Distance Education. Report on a Study Visit to North America September/October 1985. Project Report CCET/2.
INSTITUTION Open Univ., Walton, Bletchley, Bucks (England). Inst. of Educational Technology.
PUB DATE Nov 85
NOTE 16p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Distance Education; Electronic Equipment; *Electronic Mail; Foreign Countries; Higher Education; *Telecommunications; *Teleconferencing
IDENTIFIERS North America; *Open University (Great Britain)

ABSTRACT

This report of a study visit to North America describes three different computer-mediated conferencing systems (CMCS) and how they are used. The first system is COSY (COnferencing SYstem), at the University of Guelph, Ontario. The second system is EIES (the Electronic Information and Exchange System), at the New Jersey Institute of Technology. The third system is PARTICIPATE, developed by Participation Systems, Inc., and in use at the New York Institute of Technology. In Great Britain, each of these systems can be accessed from the Open Univeristy, and the purpose of this visit was to make contacts with educational users of the systems and investigate possible applications of computer-mediated communication for Open University courses. The visit provided useful guidelines for trials of electronic mail and computer-mediated communications in distance education, particularly on courses which already require students and tutors to have home equipment, and/or low population specialist courses where communication between participants is a key element in the learning process. The appendixes consist of: (1) information about on-line conferences on the three systems; and (2) a two-page bibliography listing sources of additional information on each of the systems. (DJR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED273261

THE OPEN UNIVERSITY

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Project Report CCET/2

COMPUTER-MEDIATED COMMUNICATION SYSTEMS FOR DISTANCE EDUCATION

Report on a Study Visit to North America
September/ October 1985

Tony Kaye
Institute of Educational Technology
Open University
Milton Keynes MK7 6AA

November 1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

E.S. Henderson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR013265

Contents

Acknowledgements 2

Summary 3

Rationale 3

Computer-Mediated Communication Systems (CMCS) 5

COSY, University of Guelph, Ontario 6

EIES , New Jersey Institute of Technology 7

PARTICIPATE, at New York Institute of Technology 8

Conclusions 10

Appendix 1: Some Relevant Computer Conferences 12

Appendix 2: Documents and Reports 13

Acknowledgements

I would like to warmly acknowledge the help and good advice which I received during my visits to New Jersey, New York, Ontario, and Québec (September 23 - October 23, 1985) from:
o John Black, University of Guelph, Ontario
o Jo Bochiarro, New School for Social Research, Manhattan, New York
o Gary Boyd, Concordia University, Montreal
o Lynn Davie, Ontario Institute for Studies in Education, Toronto
o Linda Harasim, Ontario Institute for Studies in Education, Toronto
o France Henri, Télé-Université du Québec, Montréal
o Starr Roxanne Hiltz, New Jersey Institute of Technology, Newark
o Marcia Johnson, Ontario Institute for Studies in Education, Toronto
o Thérèse Lamy, Télé-Université du Québec, Montréal
o Christine Languth, New York Institute of Technology, Islip, Long Island
o Paul Levinson, New School for Social Research, Manhattan, New York
o Don McNeil, New York Institute of Technology, Islip, Long Island
o Claire Meunier, Université de Montréal
o David Mitchell, Concordia University, Montreal
o John Ord, TV Ontario, Toronto
o Angela Richards, New York Institute of Technology, Islip, Long Island
o Tom Smith, University of Guelph, Ontario
o Judith Tobin, TV Ontario, Toronto
o Murray Turoff, New Jersey Institute of Technology, Newark
o Mark Waldron, University of Guelph, Ontario

Thanks to COSY, EIES, and PARTICIPATE, we can still maintain easy channels of communication with each other, and I hope that , as a community aware of the potential of computer-mediated communication for education, we can continue our exchanges.

I am grateful to the Overseas Travel Committee, the Institute of Educational Technology, and the Distance Education Research Group, all of the Open University, for helping to cover the costs of my visit, and to the Télé-Université du Québec for providing office help during my stay in Montreal.

> "The catch-22 of this particular technology is that people generally cannot comprehend this form of communication until they have experienced it. It is not possible to ask a scientist, businessman, teenager, social worker, or housewife how each would use computerised conferencing and expect valid answers until those indviduals have experimented with it enough to understand what it is"
>
> (Starr Roxanne Hiltz and Murray Turoff: *The Network Nation: Human Communication via Computer*, Reading, Mass., Addison- Wesley, 1978, p 443)

Summary

This report briefly describes current educational applications of three different computer conferencing systems (COSY, EIES, and PARTICIPATE) ; each of these can be accessed from the Open University, and thus demonstrated to colleagues. First-hand experience of using such systems is a necessary pre-requisite to understanding their potential in a distance education setting.

The purpose of this visit was to make initial personal contacts with educational users of the systems decribed, as part of an overall plan (see Project Report CCET/1) to investigate the possible applications of computer-mediated communication on Open University courses. These initial contacts can be maintained through communications on the three systems concerned - each of which contains an ongoing public conference on educational applications of computer conferencing.

The visit, and follow-up reading both of conference contents and written reports and documents (see Appendix 1 and 2), has provided many useful guidelines for our own early trials of electronic mail and computer conferencing on selected Open University courses. Above all, it has demonstrated to me the feasibility of using computer-mediated communications in distance education, particularly on courses which already require students and tutors to have home computing equipment, and / or on low population specialist courses where communication amongst students, and between students and tutors, is a key element in the learning process.

Rationale

Despite current cutbacks in Government funding, there can be no doubt about the Open University's success in attracting students at the moment. Applications for next year's undergraduate courses exceed 56,000, even though only 20,000 new places are available. Altogether the OU will have more than 120,000 students next year in its undergraduate and continuing education programmes, making it Britain's biggest university as well as the country's biggest training agency.

On the international scene, the demonstration by the OU that it is possible to provide a cost-effective higher education of quality through the carefully integrated use of print, broadcasts, various other media, and face-to-face and correspondence tuition, has inspired university level education at a distance throughout the world. As a result, since the early 1970's, OU staff have been involved in one capacity or another in major distance education projects in Canada, Costa Rica, Venezuela, West Germany, Norway, Holland, Spain, Iran, Israel, Pakistan, Sri Lanka, India, Thailand, Hong Kong, Japan, and Australia. At the moment, the University is providing consultancy help to the Chinese Central Broadcasting and Television University, which, with over 800,000 current enrolments, is the world's largest distance teaching higher education institution.

However, this degree of success should not lead us to believe there is no room for improvement in the methods adopted by the OU and other institutions of mass higher education; in fact there are a number of problems associated with the teaching methods currently used by such large-scale distance teaching enterprises. Some are linked to the shift of the major cost elements in distance education , as opposed to face-to-face education, from student- related , recurrent, teaching costs to course- related materials development and infrastructure costs; they include :

- the expense of up-dating and modifying mass-produced print and audio-visual materials : a course life of 5-8 years seems to be generally considered as necessary to amortise high materials development costs
- the difficulty of introducing innovations in teaching or delivery methods into highly standardised and centralised production and distribution systems
- the relative inflexibility of many distance education delivery methods in responding to individual students' needs, interests, and experiences
- the limited opportunities for dialogue and group interaction amongst students, and between students and tutors, within what is predominantly a one-way communication system.

Some of these problems can become particularly acute when a system originally designed for handling very large population introductory courses is required to deliver, *nationally*, a wide range of higher level low population courses, in response both to the diversity of student interests and to academic expectations of what constitutes a comprehensive university curriculum. In 1985, for example, 44 out of 129 post-Foundation Level Open University undergraduate courses had less than 200 enrollments; a further 21 had between 200 and 300 students. In addition, an increasing number of low population post-graduate courses are being added to the academic programme.

It is probable that, were the Open University being designed now, in 1985, serious attention would be being paid to the ways in which new developments in information and communication technologies could be used to produce a more flexible system with more scope for two-way communication. And this need not necessarily imply greatly increased running costs: in the not too distant future the OU's course presentation costs might even be reduced if every tutor and student were supplied with a micro-computer with communications facilities to our mainframe computers when they join. This could lead to significant reductions in the costs of some elements of tutorial provision, in the costs of mailing and processing a proportion of our written and printed communications and in the areas of student and course administration. But it would also help overcome some of the other problems listed above, by making the system more interactive and convivial. And on the course production side, taking into account recent developments in word processing and other document preparation technologies, there is no doubt that we would be using different procedures from our present ones for preparation and production of printed course materials were the system being designed now.

If the OU wants to *remain* at the forefront of distance teaching methodology, and at the same time provide a better and more flexible service to its students, tutors, and faculty staff, then it needs to start practical trials now of the ways in which the new technologies can best be applied within its system.

The University has in the past been a major innovator in the use of computers and information technology, in the running and administration of its system (student registration, fee payments, records, assessment etc) , in communications between the thirteen Regional Offices and the Milton Keynes campus, and in its teaching (use of CAL materials on many science, mathematics, and technology courses, for example). The University's Academic Computing Service (ACS) network provides computing facilities at terminals in around 300 local study centres, as well as to a small number of current and planned courses which require students and tutors to have home microcomputers and modems. The justification for needing home computing facilities has generally been made in terms of students needing to spend significant amounts of time on activities such as : uploading and downloading software from one of the mainframe computers, carrying out complex mathematical and statistical operations, accessing CAL material, or learning programming skills and languages.

However, we seem to have given little practical thought so far to the potential of using home-based computer facilities to enable students , tutors, and central and regional faculty and administrative staff to *communicate* with each other, nor to the ways in which such facilities could be used for relatively economical up-dating of courses (eg through the creation of limited course data-bases).

The really innovative work in the application of computer-mediated communication systems to higher education at a distance is being carried out in a small number of institutions in North America which have developed or have access to the necessary computer conferencing software. Interestingly enough, these are *not* primarily distance education institutions , although like most North American universities, they are concerned with ways of extending their on-campus provision to external students. The main purpose of my study visit was to gain first-hand experience of the educational use of three different computer-mediated communication systems, namely COSY (at the University of Guelph, Ontario), EIES (at New Jersey Institute of Technology), and PARTICIPATE (as used by New York Institute of Technology). My second, related, objective, was to learn how to use these systems myself, by obtaining registrations on them, and thus be able to demonstrate them to colleagues at the OU as a prior stage to starting trials on some of our own courses (see report CCET/1).

Before discussing the educational applications of each of these systems, a brief summary of the main general features of computer-mediated communication systems is presented below.

Computer-Mediated Communication Systems (CMCS)

A computer-mediated communication system allows individuals and groups of people to carry on discussions and conversations over a computer network regardless of time and place constraints, via messages keyed in to microcomputers connected by telephone to a central computer. Such a system is in many ways an ideal medium for students, tutors, and course team members involved in distance education courses. Four CMCS features stand out as being practically tailor-made for our environment:

- once the equipment (microcomputers, modems, mainframe) and necessary software and network facilities are in place, *communication costs are very low :* the great majority of OU tutors and students should be able to access our mainframe computers at local call rates (40p per hour at evenings and weekends)
- communications (whilst being virtually instantaneous to the mainframe computer) are *asynchronous,* unlike face-to-face meetings or telephone calls and conferences; messages can be entered and retrieved when convenient to users of the system, permitting time for reflection and for thoughtful composition
- all communications are *stored* until deliberately deleted, and can be filed in such a way as to be immediately accessible when required - a feature not found with face-to-face and telephone communication unless burdensome recording procedures are employed
- the processing power of the mainframe computer and its CMCS software can be used to *organise and structure* inputs, outputs, and communication patterns in a variety of different ways.

This last point is of particular importance; although current computer conferencing software packages vary in their degree of sophistication, several can support the following functions:

- electronic mail, both one to one and one to group, usually with automatic signalling of mail that has been read
- computer conferencing, with the ability to assign specialist roles to different participants (moderator, secretary, read-only membership etc) and with different categories of conference (open, closed, private); in some systems, the possibility of creating branching conferences exists
- private notepads for personal documents and notes
- signalling of current on-line participants, with the possibility of synchronous communication
- a directory of members with users' names, adresses, interests etc
- on-line text editing

- free text search and retrieval , enabling participants to access messages by topic, date, name of sender, or by any given string of characters in either the text or header
- voting or polling on forced-choice questions, with instantaneous display of results
- transfer of files , both to and from other systems (eg data-bases, electronic mail systems) and to and from the user's microcomputer.

A computer-mediated communication system is thus qualitatively different from other interpersonal and group communication media; in our context, it should be seen as a new medium which could permit us to do new things, and not simply as an electronic replacement for correspondence tuition, face-to-face tutorials or telephone contact.

In fact, there is some research evidence to demonstrate that introducing computer conferencing technology into organisations and communities (eg dispersed communities of scientists) may actually *increase* the frequency of other forms of communication, partly because it enables people who would never have met /communicated otherwise to make contact with each other very easily. Participating in an open computer conference , for example, can be highly serendipitous: one can type in a suggestion, or a request for help or advice (rather like throwing a bottle with a message in it into the sea) and then discover on logging in a few days later that several other, possibly unknown, participants have responded with suggestions and ideas. As a result, networks of relationships and contacts can develop in totally unanticipated patterns.

The challenge of introducing CMCS into a complex distance education system like the Open University's will lie in developing new forms of course design which can not only accomodate this new medium, but also exploit it to its best advantage. This needs to be done without overloading the system (tutors, course team members, ACS) and thus leading to large increases in course presentation costs ; merely adding a CMCS facility on to our present course model may not only be pedagogically ineffective, but also represent a significant additional cost. I return to this issue later, after the following brief descriptions of educational applications of the three systems visited, and on which I am now registered.

COSY, University of Guelph, Ontario

The first version of COSY (COnferencing SYstem) was available in early 1983, developed by Guelph University's Institute of Computer Studies, and based on the COM system. The initial impetus for its development was to provide a more sophisticated tool than the heavily used electronic mail system for communication amongst academics on the university campus. Its use has now expanded widely beyond the campus, both within Canada and overseas, to include 400 off-campus users, with subscribers in 28 different countries; it has recently been adopted by "BYTE" magazine (a micro-computer magazine published by McGraw-Hill with circulation figures of 450,000) for its information exchange "BIX".

COSY is written in 'C' , originally ran on a VAX, Berkeley 4.2, and is now on a UTS operating system on an IBM mainframe. The user interface is based on a command-driven system with help options, and there is an on-line tutorial ("Learn") for novice users. Although a detailed user manual exists, the system was deliberately designed to be learnable without it. Particular attention was paid to making the system as user-friendly as possible, especially as it was envisaged that many people would be accessing COSY at 300 baud over phone lines and packet networks. Three specialist support staff provide training and liaison help. A number of modifications have been made to the system in the last two years in response to users' experience: for example, the procedure for preparing and entering messages for conferences has been improved. There are currently about 250 active conferences on the system, of which around 50 are open or public.

Use of COSY in teaching at Guelph University started in 1984 with a course on *Adult Education: Principles and Practice* for a group of graduate students in the School of Extension Education. COSY was used over a ten week period as a seminar tool during the Fall 1984 semester. Evaluation

of this pilot experiment revealed the importance of initial training (a professional introductory tutorial is recommended) and of getting all participants started in the conference at about the same time; students who joined late because of dificulties in initial logging-in and over access to terminals felt at a disadvantage. The roles that the moderator and participants are going to play in the conference need to be negotiated and defined early on, and issues such as the chief topics to be covered in mesages, as well as optimal message lengths, need to be discussed and agreed upon.

In the current academic year, electronic messaging and computer conferencing using COSY are planned for a number of courses (in economics, sociology, English literature, adult education, and food administration).

Other educational users of COSY include TVOntario, whose Telematics Department has set up a field test of computer conferencing as a communications tool for school board computer coordinators throughout Ontario. The project will test the feasibility of setting up a network for exchanging information on the use of computers in the classroom, and for sharing software through a downloading and uploading facility. Participants have been asked to spend at least half an hour a day on the system so as to keep discussions active; four main conferences have been set up on COSY for this project. The trial is being extensively evaluated.

The Ontario Institute for Studies in Education (OISE) is currently evaluating a number of computer conferencing systems, including a VMS version of COSY, as well as PORTACOM, and PARTICIPATE, with a view to mounting pilot projects into the use of computer conferencing in education within the Province (eg for creating a network for teachers and teacher trainers, and for an "Electronic University"). In addition, OISE is planning to use computer conferencing in 1986 for one of its own courses (*Special Topics in Adult Education : Perspectives in Community Development*). This is a distance education course designed for students living throughout Ontario; it will combine computer conferencing with self-directed study and occasional face-to-face workshops. Students will be asked to participate actively in the evaluation of computer conferencing as a learning tool.

EIES, at New Jersey Institute of Technology

This system, designed by Murray Turoff, is based at the Computerised Conferencing and Communication Centre at New Jersey Institute of Technology (NJIT). Murray Turoff is a pioneer in the field of computer conferencing, having been closely involved in the first operational system of this kind (EMISARI) at the Office for Emergency Preparedness in the White House in the early 1970's. EIES (the Electronic Information and Exchange System) was originally established to improve communication between small, dispersed research communities of scientists. Its use has been since extended to other knowledge workers (around 2500 worldwide) in a range of organisations , including private companies (eg IBM, Xerox Corp., 3M), universities (e.g. Harvard, Stanford), the US Government (eg NASA), unions, hospitals, and various professional associations. A strong feature of EIES is the fact that its use has been extensively researched and documented during the last eight years or so; as a result not only has a mass of invaluable data been made public, but the system has been constantly modified and enhanced in response to feedback.

The current version of EIES runs on a dedicated Perkin Elmer 3230 minicomputer and can support up to 40 simultaneous users. It can be accessed through direct phone calls, or via the TELENET and UNINET packet switched networks. The main general purpose program is written in FORTRAN; coupled with this is a special purpose language interpreter (INTERACT) which permits the design of tailored environmments by users and user groups. The Computerised Conferencing and Communications Centre at NJIT, responsible for running EIES, employs around 12 staff, and provides on-line help through user consultants.

In the last few years, a number of trials of the use of EIES in education and training have been carried out ; these include training seminars for executives run by the Western Behavioural Sciences Insitute in La Jolla, California, and pilot oferings of a number of continuing education courses at NJIT.

The most recent educational application is provided through the "Connected Education" project, which provides on-line courses for credit in the programme of offerings of the New School for Social Research in Manhattan. (The New School is the largest adult education university in the USA, with over 2000 courses on offer each term; this is its first venture into the distance education field). Current and planned Connected-Ed courses are within the School's MA in Media Studies Program; the Fall 1985 semester includes three courses : *Teleworld, Artificial Intelligence and Real Life*, and *Propaganda: The Literary Science*. Further courses are in preparation for the Spring semester, on subjects including nuclear energy, women at work, science fiction, writing, and programming; there is to be an inter-session course this winter on *Computer Conferencing in Business and Education*. Students provide their own microcomputers and modems; tuition fees cover all computer operating and connection charges, with the exception of local telephone calls (for US residents) to connect to the central system. It is expected that each student would spend about 30 hours on-line (at 300 baud) for each 3 credit course (a classroom-based 3 credit course assumes a total of 45 hours contact time, plus about the same amount of time in private reading and writing). Even though the program has only just started, the courses have attracted students from the Western USA, Tokyo, and Singapore, as well as the New York / New Jersey area. Two of the instructors in these first courses are based in New York/New Jersey, the third in California.

Although there has been discussion of combining computer conferencing with other media in Connect-Ed's programme, the project staff have decided on attempting to teach *entire courses* via this technology as a first priority. Apart from reading of recommended texts available from bookshops, all learning activities involve communication via EIES. Students are advised to use local intelligence and storage space on their micros for off-line preparation of text material, and to download documents which they want to consult at leisure or print out. For each course, the actual "classes" are conducted in two conferences, one in which students have read-only membership and in which the instructor inputs documents, commentary, problems etc., the other to which both students and instructor can write comments. In addition, a number of further conferences have been established to create an electronic campus environment; these include a "cafe" (all students, faculty, and associates), a "student lounge" (students only), a "faculty lounge" (faculty only) and a technical forum for handling user queries concerning EIES commands and features. There is also a Connect-Ed electronic library and newsletter. In addition, students are encourage to participate in the activities of the wider EIES community, through involvement in appropriate public conferences on the system.

Connect-Ed's teaching is being evaluated along with other educational uses of EIES as part of a research and development programme on a "virtual classroom" at NJIT. This programme will lead to the design of a Mark II version of EIES which will run on IBM compatible computers, and which will incorporate new features to enhance educational applications - including graphics and branching capabilities.

PARTICIPATE, at New York Institute of Technology

PARTICIPATE is a commercially available computer conferencing system developed by Participation Systems Inc., and available in an earlier version on The Source. It has been extensively modified for educational use at New York Institute of Technology (NYIT) for its Independent Study Program (known as the American Open University). It runs on a dedicated VAX 11/788 mainframe computer at NYIT, separate from the Institute's other computers; this was a deliberate policy , both to minimise security risks, and to ensure adequate disk space for files. It can be accessed via TELENET or through a direct telephone connection. Particular features include easy to use menu-driven commands for novice users, which can be turned off once one is familiar

with the system, and a facility for creating branching topics from a main conference. The system has many other (outside) users in addition to NYIT students and faculty - for example, Participate Systems Inc. use it as a demonstration faciltity.

NYIT started its trials of computer-mediated communication by incorporating an electronic mail component into two independent study psychology courses during the spring and summer of 1983. This was used to allow the instructor to send communications to all members of the student group, as well as for private communications between students and between student and instructor. Students not only appreciated the convenience of this form of communication for discussing homework assignments and other course related issues, but also used it to help each other.

During the last academic year, a range of courses in the Independent Study Program have included a computer conferencing option using PARTICIPATE. The courses in this Program are distance study versions of the equivalent on-campus courses, taught by the same instructors. They are drawn from three of the Institute's faculties, and lead to Bachelor of Science degrees in Behavioural Sciences, Business Administration, and General Studies. For each course in the Program, students receive in the mail a Course learning Package consisting of a textbook, a study guide, course objectives, and self-assessment materials. For many courses, external students can opt either for written correspondence tuition from their mentor/instructor, or for electronic comunication in the form of computer conferencing seminars and private messaging. Assessment is based on written or electronic homework assignments, a mid-course evaluation, and a final examination. At the present time, about 60 faculty staff use PARTICIPATE for tutoring external students; in general, they find that it requires more time and more flexibility on their part than does written correspondence tuition.

New users are automatically invited to join a conference called "welcome", which provides on-line information about the system; an excellent user manual (*Welcome to the Parti*) is provided to all students. Faculty staff are invited to attend workshops in which they receive training in developing appropriate mentor skills for computer conferencing. They then have access to an on-line conference ("Mentor") in which the mentoring role is discussed, and through which the more advanced features of the system are introduced.

The ways in which mentors and students use PARTICIPATE varies depending on the nature of the course and the mentor's style. A course on *An Introduction to Effective Communication,* for example, made extensive use of the branching facility; each week one student was encouraged to enter a homework assignment into a special branch off the main course conference so that other students could read and comment on it. At the beginning of the course, each student was asked to introduce themseves electronically and describe their reasons for takng the course; during the course itself, quizzes, buzz groups, debates, polls and application exercises were used to deliberately increase student participation and interactivity. Other courses, such as *Introductory Psychology*, made no use of the branching feature, and the primary function of the course conference was to clarify concepts and to answer content questions raised by students, much as would happen in a face-to-face class. And, as in a class, of course, all participants benefit from the answers given to questions raised by any one participant. In this course, most communications were between students and mentor, with little student- to-student help.

On a standard 3 credit (8 week) courses, students would average between 1-2 hours per week in on-line communications, although studies show that the range of times can be very large. It would seem that mentors (tutors) with responsibility for a dozen or so students on a course would need to spend up to ten hours per week on-line. Evaluation of student reactions to use of computer conferencing has emphasised the following points:

- the importance of learning to use the system as quickly as possible at the beginning of the course, so as to be able to move on from mastering the mechanics of communication to using it to discuss the course itself: both student and mentor require high levels of motivation and ability for this to happen

- the ability to communicate easily and conveniently with the course mentor was seen as the most important feature , followed by the sharing of ideas and homework assignments with other students
- the overwhelming majority of students indicated that they would like to take further courses with a computer conferencing component.
- the great majority of messages sent in by both students and mentors are related to course content, although at the beginning of a course, there tends to be a high proportion of messages concerning technical help in using the system.

Enhancements which the NYIT staff feel would be important in developing educational uses of computer conferencing include file transfer facilities, and access to CAL material, library data-bases, and other sources of information.

Conclusions

Three different ways of using computer-mediated communication methods for education can be distinguished in the projects which I visited:
- as an adjunct to on-campus classes in some of the courses at the University of Guelph
- as an adjunct to essentially print-based distance education versions of on-campus courses at New York Institute of Technology
- as the principal teaching medium in the Connect-Ed courses on EIES.

Note that in all three cases, numbers of students on a given course are fairly low, compared with the mass audiences of many OU courses. This is presumably because the courses are being given by campus-based institutions whose primary educational mode is face-to-face class teaching by individual faculty members, and where there are pre-existing norms and expectations for teacher/student ratios. To my knowledge, there is no existing experience of use of computer conferencing on courses with, for example, several hundred students. Nor have there yet been many practical trials of integrating computer conferencing into the multi-media courses produced by any of the distance teaching universities. An exception is Deakin university (Victoria, Australia), which uses an electronic mail facility on its graduate Diploma of Computing, for student-tutor communications and for submission of assignments; the Open Learning Institute (British Columbia) and Athabasca University (Alberta) are both looking at the feasibility and possible applications of computer conferencing in their teaching.

As far as pedagogical issues are concerned, there would seem then to be two challenges for the OU in trying to use CMCS in its teaching system:
- the problem of scale: we are dealing with course populations in the hundreds rather than in the tens
- the problem of integration : we would need to integrate this medium not only with the OU's print and audiovisual course materials, but into our course development system (course teams as opposed to individual teachers), and into our course presentation system (notably the use of part-time tutors as intermediaries).

The problem of numbers can be tackled in several ways. Firstly, a clear distinction should be made between essentially one-way use of a CMCS , and interactive use. In the former case, one could envisage, for example, the use of a data- base under the control of a designated member of the course team (the course chair or course manager acting as editor) which would be used for stop-press and up-dating items. Course team members and tutors might be invited to submit suggested items for inclusion to the data-base editor , and students would have read-only access. Such a system would work equally well regardless of the total number of students on the course- in fact the cost advantage of a CMCS over postal mailings increases with numbers in this case.

In the latter case - interactive use in the individual or group mode, we would need to consider the tutor group as being the basic unit within which communication occurs - our norm of 25 students

to one part-time tutor fits well with what may be an optimal group size for educational applications of computer conferencing such as on-line seminars and tutorials. It is also a size which easily permits the establishment of self-help groups, especially as the students would have had the opportunity to meet face-to-face and thus get to know each other personally.

However, this does not imply that communication should occur *only* within individual tutor groups. One could envisage, in addition, the setting up of a conference which could permit all tutors and maintenance course team members to share information; such a facility could be used for briefing, comparing marking and tuition practices, obtaining specialist help, evaluation, and feedback. Finally, on relatively low population courses, it would not be out of the question to have a general course conference to which all students and tutors could contribute. In 1985 there were 17 undergraduate courses which had less than 100 students (all, with one exception, third and fourth level) - courses such as these, in which face- to-face meetings must be fairly difficult to organise , seem ideal candidates for a course-wide group communication facility.

Integration of computer-mediated communications into our teaching system is a more problematic issue than that of scale. It is probably only through experience of using the technology within the course team and amongst tutors and students that the best ideas will appear for integrating the medium with the core course materials. In this context, it might be useful on some courses to explore its potential for course development ; experience of use of EIES by groups working on common projects demonstrate that computer conferencing can be a very effective medium for achieving consensus and for joint preparation of working group reports. Such a facility would certainly make it easier in the OU context for dispersed members of course teams (Staff Tutors, consultants, faculty working from home) to contribute to course team discussions on content and objectives. And out of such an experience, ideas for using computer conferencing in teaching may well develop. It certainly has a potential for being more than just an electronic substitute for correspondence tuition and face-to-face tutorials, and will permit educational applications which are impossible, or too expensive to organise, in our current system.

We cannot start exploring the pedagogical issues involved in using computer conferencing, however, until the practical aspects have been adressed. At the present time, it would probably be sensible to restrict trials to the courses where students (and tutors) are already required to have home-based computing and communications facilities - ie to the small number of such courses in the areas of computing and information technology. Students and tutors on these courses will presumably have already overcome any resistances to using microcomputers and modems from home , and will only have to learn one new skill - how to use the particular computer conferencing / electronic mail facility. And such a relatively "computer literate" population will presumably place less demands on ACS services for provision of user help .

In the medium and longer term, however, it would be sensible to explore the pros and cons of introducing computer-mediated communication facilities into low population specialist and post-graduate courses in other areas , such as social sciences, humanities, and education . There is no educational reason why this technology should be restricted to mathematics/ technology courses; in fact, many of the initiatives for using computer conferencing in the institutions which I visited came from outside these discipline areas.

In parallell with any trials on Open University courses, it would be valuable for individual OU staff members interested in this technology to gain first-hand experience of using existing systems through participating in some of the public conferences listed in Appendix 1 below, and maybe even through doing some occasional "electronic tutoring" themselves.

Appendix 1: Some Relevant Computer Conferences

There are a number of conferences on the three systems to which I have been allowed access which are potentially of great value to us in our efforts to introduce CMCS into appropriate OU courses. These are of two sorts:
- open conferences *about* specific topics, such as distance education, extension education, computers in education ; by contributing to these conferences ourselves we can exchange ideas , progress reports , and results with a wide range of other teachers and researchers interested in using CMCS in education
- closed or restricted access conferences which are themselves *examples* of the use of CMCS in education, and which form major elements of specific teaching / educational administration programmes.

The conferences listed below are a selection of the more important ones; they are all currently "live"; anybody who would like to browse through those of them which are open or public should contact me.

<u>On COSY, at the University of Guelph:</u>

- "**disted**" : started in October , 1983, this open conference has four topics (or sub-conferences) - "reach", "students", "computers" and "documentation" . The most extensive is "disted/reach", which currently contains around 150 entries. "disted/documentation" was set up to provide help to users hunting for information and research reports in the field, and the OU's International Documentation Centre on Distance Education (Keith Harry is registered on COSY) will hopefully contribute here as a key information provider.

- "**cosyined**", open , started in September, 1984; specifically concerned with ways in which computer conferencing can be used to suport the delivery of university courses, with many contributions from Faculty members who have used COSY in their courses (on-campus and off-campus); currently contains about 80 entries.

- "**tvoicon**", started in October 1985, this has four topics ("general", "environment", "networking", and "technical"); it is being run by the Telematics Dept at TVOntario to enable School Board computer coordinators throughout Ontario to exchange ideas and experiences in the use of computers in education, particularly the ICON micro which has been adopted by the Provincial Ministry of Education for school use.

<u>On EIES, at New Jersey Institute of Technology:</u>

- "**computers in education**", a public conference, with over 500 entries

- "**software for learning**", a public conference

- "**future of telecommunications**", a public conference

- various conferences for students, faculty, and associate members of the Connected Education project at the New School for Social Research, particularly "**connect ed associates' terrace**" and "**cafe**", both of which , together with the Connect Ed electronic newsletter ("**synapse**") are very valuable sources of information, advice, and opinions on the joys and pitfalls of teaching courses entirely through computer conferencing .

<u>On Participate, at New York Institute of Technology:</u>

- "**educating with PARTI**" : a public conference in which Faculty members, project administrators, and students share their views and experiences of using PARTI for on-line courses; started in February 1985, currently contains over 350 entries.

Appendix 2: Documents and Reports

This appendix lists relevant documents and reports on computer conferencing produced by staff of the institutions visited.

TV Ontario

o ORD, J (1985) *Electronic Communications: Computer Conferencing, Computer Networks, Interactive Cable* .Toronto, TV Ontario, Working Papers of the Office for Development Research no 85-4, July 1985, 40 pp.

Ontario Institute for Studies in Education (OISE)

o DAVIE, L. and PALMER, P (1984) 'Computer Teleconferencing for Advanced Distance Education' , *Canadian Journal of University Continuing Education*, X, 2, 56-66

o HARASIM, J and JOHNSON, M (available in 1986) *Research into the Educational Applications of Computer Networks for Teachers/ Trainers in Ontario, The Impact of Technology on Education : The Impact of Computers on Teacher Training Staff* Toronto , OISE/Ontario Ministry of Education

University of Guelph

o BLACK, J (1985) *Computer Conferencing: bridging time and distance in scientific communications* , Helsinki, GIAM VII,

o BALSON, D (ed) *International Computer-based Conference on Biotechnology: a Case Study* , Ottawa, International Development Research Centre,108 pp

o BROCHET, M *Effective Moderation of Computer Conferences: notes and suggestions*, University of Guelph, Computing Support Services, 20 pp.

o UNIVERSITY OF GUELPH (1985) *Computer Conferencing and Electronic Messaging, Conference Proceedings, Jan 22-23, 1985*, (contains 21 papers) 227 pp

o UNIVERSITY OF GUELPH (1985) *COSY Computer Conferencing System User Guide, version 3.1*., COSY Systems Group, 59 pp

New Jersey Institute of Technology (NJIT)

o HILTZ, S (1985) *The Virtual Classroom: initial explorations of computer-mediated communication systems as an interactive learning space*, Newark, NJIT, 30 pp

o HILTZ, R and TUROFF, M (1985) 'Structuring Computer-Mediated Communication Systems to Avoid Overload', *Communications of the ACM*, vol 28, 7, 9 pp

o KERR E, and HILTZ, S (1982) *Computer-Mediated Communication Systems: status and evaluation* , New York, Academic Press, 212 pp

o NEW JERSEY INSTITUTE OF TECHNOLOGY (1982) , *Telecommunications and Higher Education: Conference Briefs, April 1982* Newark, N.J. , 101 pp
(contains 16 papers)

o NEW JERSEY INSTITUTE OF TECHNOLOGY (1985), *Tools for the Enhancement and Evalaution of a Virtual Classroom: A proposal to the Annenberg/ Corporation for Public Broadcasting Project*, Newark, N.J., 82pp + appendices

o NEW JERSEY INSTITUTE OF TECHNOLOGY (1985), *EIES User Manual*

New York Institute of Technology (NYIT)

o HAILE, P and RICHARDS, A (1984) *Supporting the Distance Learner with Computer Teleconferencing*, Islip, NYIT/ American Open University, 29 pp

o KREMERS, S and SPITZER, M (1984) *Using Participate: Welcome to the PARTI, a Student Manual*, Old Westbury, NYIT, 51 pp

o RICHARDS, A et al (1984) *On-Line at NYIT: computer teleconferencing workshops for faculty*, Islip, NYIT, 8 pp